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EXAMINER
BERNATZ, KEVIN M

ART UNIT	PAPER NUMBER
1773	

DATE MAILED: 08/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/846,889	FEIST ET AL.
	Examiner	Art Unit
	Kevin M Bernatz	1773

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-60 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-57,59 and 60 is/are rejected.

7)☒ Claim(s) 8 and 58 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Examiner's Comments

2. Upon reconsideration and partly in view of applicants' arguments in the Appeal Brief of June 9, 2004, the rejections of February 9, 2004 are withdrawn and prosecution reopened. The Examiner apologizes for the inconvenience caused by the necessity of the reopening of prosecution. An office action on the merits follows below.

3. Regarding claims 5 – 7, the Examiner notes that the areal recording density of a medium is not a positive limitation in so far as it applies *solely* to the medium. Specifically, while the structure of the medium (including the substrate) affects the recording density (*see Annacone et al., U.S. Patent No. 6,194,045, col. 1, lines 28 – 31; and Tenhover et al., U.S. Patent No. 5,741,403, col. 3, lines 5 – 10*), there are many additional parameters such as head-disk spacing (*Annacone et al., col. 1, lines 38 – 48; and Tenhover et al., col. 1, lines 48 – 56*) and the type of magnetic/under layers used (*Guha et al., U.S. Patent No. 6,146,755, col. 1, lines 23 – 57, col. 2, lines 42 – 67, col. 3, lines 5 – 22, and col. 5, lines 33 – 45; and Sandstrom, U.S. Patent No. 5,972,461, col. 3, lines 51 – 57 and col. 9, lines 35 - 38*). The Examiner notes recording densities of over 100 Gbit/in^2, even up to 400 Gbit/in^2 are known in the art (*Guha et al., ibid*). As

such, the areal recording density is only a positive limitation in so far as an apparatus claim is concerned, since it is directed to the combined interaction between the medium and the head used to read and write to the medium. Presently, the limitations regarding the areal recording density are directed solely to a medium (e.g. "wherein said storage media has an areal recording density capability of ...") and for the purposes of evaluating the prior art, the Examiner has interpreted the limitations regarding the areal recording density only as it impacts the structure of the medium.

Specifically, the Examiner notes that the medium *in its entirety* must be capable of achieving the claimed areal recording density, regardless of the relative head-disk spacing.

4. Regarding the limitation(s) directed to the "core" in claims 42 - 52, the Examiner has given the term(s) the broadest reasonable interpretation(s) consistent with the written description in applicants' specification as it would be interpreted by one of ordinary skill in the art. *In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997); *In re Donaldson Co., Inc.*, 16 F.3d 1190, 1192-95, 29 USPQ2d 1845, 1848-50 (Fed. Cir. 1994). See MPEP 2111. Specifically, the since applicants have claimed "wherein the substrate *further comprises* a core" (emphasis added), the Examiner has required that the substrate and the core must be different elements. As such, the structure that results from these claims is a substrate with a core *and* an additional plastic resin portion disposed between the at least one data layer and the substrate.

5. Regarding the limitation(s) "operating frequency" in claims 56 - 58, the Examiner has given the term(s) the broadest reasonable interpretation(s) consistent with the written description in applicants' specification as it would be interpreted by one of ordinary skill in the art. *In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997); *In re Donaldson Co., Inc.*, 16 F.3d 1190, 1192-95, 29 USPQ2d 1845, 1848-50 (Fed. Cir. 1994). See MPEP 2111. Specifically, one of ordinary skill in the art would recognize that typical operating frequencies are in the range of 20 – 500 Hz, with greater than 500 Hz anticipated for future applications but not presently in use at the time of applicants' invention (*applicants' specification, paragraph 0032*). Therefore, the Examiner has interpreted the limitation "operating frequency" to be limited to 20 – 500 Hz, since at the time of applicants' invention one of ordinary skill in the art would have interpreted "operating frequency" to be limited to such a frequency range.

Claim Objections

6. Claim 8 is objected to because of the following informalities: "comprising" should be "comprises" and "disposed" should be deleted inorder to correct inadvertent grammatical errors caused by a previous amendment (i.e. the claim appears that it should read: "wherein said plastic resin portion further comprises surface features.").

7. Claim 58 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Rejections - 35 USC § 103

8. Claims 1, 5, 6, 14 – 17, 19, 20, 24 – 26, 28, 30 – 40, 42, 43, 45 – 55 and 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Landin et al. (U.S. Patent No. 5,538,774) in view of Sandstrom (U.S. Patent No. 5,972,461) and Zou et al. (U.S. Patent No. 5,981,015).

Regarding claims 1, 16, 17 and 24, Landin et al. disclose a method for retrieving data (*col. 2, line 66 bridging col. 3, line 8*), comprising rotating a storage media (*ibid*) comprising at least one plastic resin portion (*see Figure 1 below – element 8*) disposed between at least one data layer (*element 6a*) and a substrate (*element 4b*), directing an energy field (*col. 3, lines 1 – 8 and col. 11, lines 12 - 19*) at said storage media such that said energy field is incident upon the data layer before it can be incident upon the substrate (*since dual layered medium, necessarily happens whether one inverts the image or not*[1]), and retrieving information from the data layer via said energy field (*col. 2, line 66 bridging col. 3, line 8*).

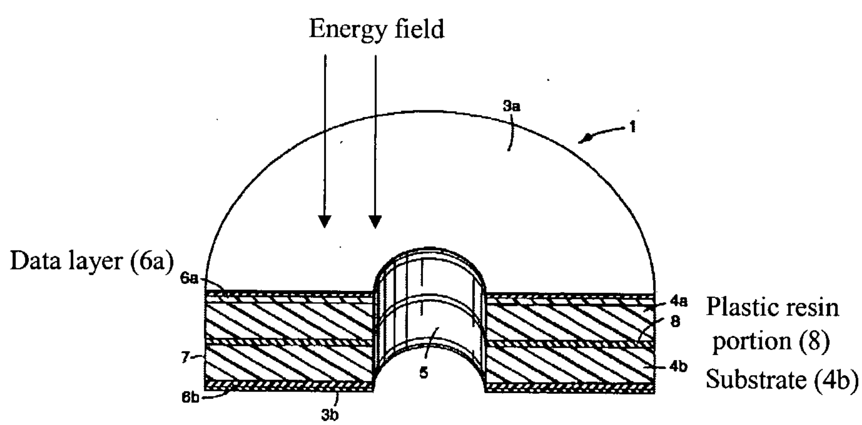

Figure 1: Landin et al. storage medium showing claimed limitations

> [1] – *If one argues that the energy field is from the opposite side, one could consider layer 6b the data storage layer and layer 4b the substrate and the energy field would still be incident on the data storage layer before being incident on the substrate.*

Regarding the limitation(s) "axial displacement peak ... under shock or vibration excitation", the Examiner has given the term(s) the broadest reasonable interpretation(s) consistent with the written description in applicants' specification as it would be interpreted by one of ordinary skill in the art. *In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997); *In re Donaldson Co., Inc.*, 16 F.3d 1190, 1192-95, 29 USPQ2d 1845, 1848-50 (Fed. Cir. 1994). See MPEP 2111.

Specifically, the axial displacement peak is the displacement of the medium measured in the peak-to-peak amplitude when a force or excitation is applied to the disk. I.e. the extent of height variations due to vibrations from the shock or vibration excitation (*see Paragraphs 0031, 0032, 0042 and examples*). The examiner notes that presently the claims do not recite under which magnitude of shock or vibration. The Examiner further notes that applicants' admit that the axial displacement peak is not a function solely of the media and that the "axial displacement can be reduced by utilizing a vibration damping material in the restraining device, or clamping structure, that holds the substrate (*Paragraph 0042*).

Landin et la. fails to teach an explicit measurement of the axial displacement or surface roughness, though Landin et al. recognizes the importance of reducing the vibration and shock effects that occur in a storage medium (*col. 1, lines 28 – 41*).

However, Sandstrom and Zou et al. provide explicit teachings to control the axial displacement to values meeting applicants' claimed ranges inorder to reduce the occurrence of head slap and insure good read/write properties of the medium (*Sandstrom, Figure 4; col. 2, lines 20 – 35; col. 2, line 63 bridging col. 3, line 18; col. 3, line 30 bridging col. 4, line 14; and col. 10, line 27 bridging col. 11, line 51; and Zou et al., col. 1, lines 39 – 43; col. 4, line 61 bridging col. 5, line 5; and Figure 1*).

Zou et al. further teach that the surface roughness should be controlled to within applicants' claimed range because such a surface "reduces a space between the magnetic head and the magnetic disc, thereby enhancing the recording density as an advantage" (*col. 5, lines 44 – 58*).

It would, therefore, have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Landin et al. to possess an axial displacement peak under shock or vibration excitation and a surface roughness meeting applicants' claimed magnitudes as taught by Sandstrom and Zou et al. inorder to reduce the occurrence of head slap, insure good read/write properties of the medium, and to reduce a space between the magnetic head and the magnetic disc, thereby enhancing the recording density.

Regarding the limitation of "an areal density of about ..." in claims 5 and 6, the Examiner notes the Sandstrom (*col. 3, lines 51 – 57 and col. 9, lines 35 – 38*) teaches

that forming recording media capable of possessing areal recording densities of about 10 $Gbit/in^2$ or higher is within the knowledge of one of ordinary skill in the art and the disclosed substrates are deemed to be capable of obtaining the claimed recording density depending on the choice of magnetic layers and the type/spacing of magnetic head used.

Regarding claims 14, 15, 19, 20, 25 and 26, the Examiner notes that the mechanical damping coefficient is defined as the loss modulus divided by the storage modulus (*applicants' specification, Paragraph 0038*), which is identical to what Landin et al. calls the "loss factor" (*col. 6, lines 12 – 31*). Landin et al. further teaches that materials with a high damping value, i.e. high value of the loss factor, ("most preferably about 1 – 10") (*ibid*), should be used inorder to improve the damping properties (i.e. loss values) of the entire substrate (*col. 5, lines 31 – 42*). It would, therefore, have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Landin et al. to use a substrate possessing large loss factors (i.e. "mechanical damping coefficient") meeting applicants' claimed limitations as taught by Landin et al., since the larger the mechanical damping coefficient of the substrate, the more resistant the substrate will be to shock or vibration (*col. 4, lines 45 – 67*).

Regarding claim 28, Landin et al. disclose resonant frequencies meeting applicants' claimed limitations (*Table 1*).

Regarding claims 30 and 31, Landin et al. disclose substrate materials meeting applicants' claimed Markush limitations (*col. 5, lines 1 – 10 and 58 – 64; and examples*).

Regarding claim 32, the Examiner notes Figure 2 below, which represents an alternative embodiment disclosed by Landin et al. (*col. 5, lines 1 – 30 and Figures 2- 4*).

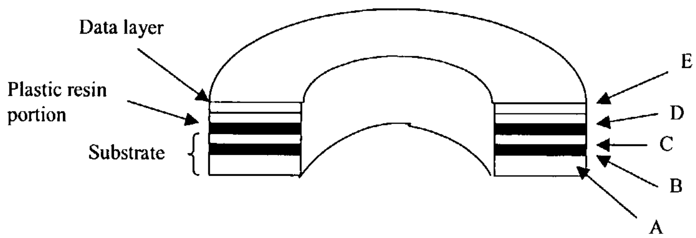

Figure 2 – Laminated substrate comprising 2 damping portions

In the above Figure, layers A, B and C represent applicants' "substrate", wherein layer B comprises damping material. Layer D is a second layer of damping material and reads on applicants' claimed "plastic resin portion" with layer E being the data storage layer (*see Landin et al. Figures 2 and 3, wherein Landin et al. teach that the substrate can preferably be formed by simply laminating alternating layers of substrate + damping material in col. 5, lines 1 - 30*). The Examiner notes that Landin et al. teach that the damping material can comprise resins meeting applicants' claimed limitations (*col. 6, lines 63 – 67*).

Regarding claim 33, Landin et al. disclose plastic resin portions meeting applicants' claimed material limitations (*col. 6, lines 42 – 67*).

Regarding claim 34, Landin et al. disclose that the substrate can further comprise metal (*as shown in Figure 2 above*) (*col. 5, lines 1 – 10 and 58 – 67*).

Regarding claims 35 and 36, Landin et al. disclose thickness values meeting applicants' claimed limitations (*claim 1: 2 – 50 μ*).

Regarding claims 37 and 38, Landin et al. disclose adding reinforcements to the substrate meeting applicants' claimed shape and material limitations (*col. 7, lines 23 – 67*).

Regarding claim 39, Landin et al. disclose substrates having substantially constant thickness (*Figures*).

Regarding claim 40, Landin et al. disclose substrates comprising hollow portions (*Figure 4b*), which the Examiner deems would read on the limitation "having varied thickness" in the embodiment represented by Figure 2 above (*see Figure 3 below, element A*).

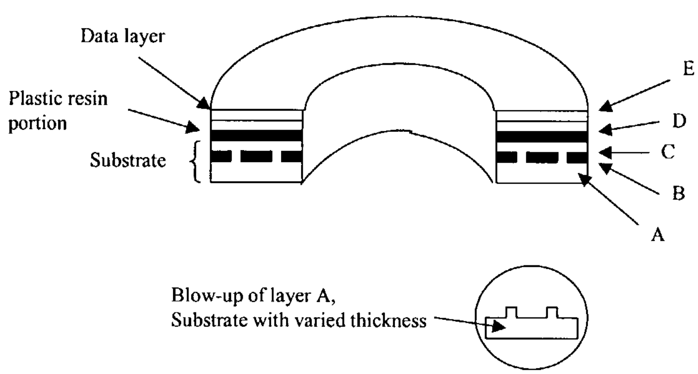

Figure 3: Illustration of "varied thickness" of substrate portion of Landin et al.

Regarding claims 42 and 45, Landin et al. disclose a "core" having a substantially constant thickness (*see Figure 2 above – element B*).

Regarding claims 43, 46, 48, 49 and 50, Landin et al. disclose a "core" having varied thickness including filled cavities (i.e. multiple portions comprising different materials – claims 49 and 50) (*see Figure 3 above, layer B*) wherein the "core" would result in rings meeting applicants' claimed Markush limitation in claim 46.

Regarding claim 47, Landin et al. disclose that the "core" shown in Figure 2 above (*layer B*) can include hollow cavities (*Landin et al. – Figure 4b and col. 10, lines 1 – 10*).

Regarding claims 51 and 52, the limitation(s) "preformed" and "formed in situ with said substrate"" are process limitations and are not further limiting in terms of the structure resulting from the claimed process. Specifically, in a product claim, as long as the prior art product meets the claimed structural limitations, the method by which the product is formed is not germane to the determination of patentability of the product unless an unobvious difference can be shown to result from the claimed process limitations. In the instant case, whether the core is formed *in situ* or preformed does not change the final structure of the product, namely a composite substrate comprising a core with at least one plastic resin portion disposed between the composite substrate and the data layer.

Regarding claims 53 and 55, Landin et al. disclose an insert meeting applicants' claimed structural limitations (*Figure 2 above, wherein the "substrate" is element C, the plastic resin portion is element D, the data layer is element E, and the insert is element B*).

Regarding claim 54, Landin et al. disclose an insert meeting applicants' claimed structural limitations (*Figure 3 above, wherein the "substrate" is element C, the plastic resin portion is element D, the data layer is element E, and the insert comprising a plurality of portions is element B*).

Regarding claim 59, Landin et al. disclose substrate materials which are deemed to necessarily possess a flexural modulus greater than about 250 kpsi (*col. 5, lines 4 – 7 and lines 60 – 64; and examples*). The Examiner's sound basis for this position is that materials such as aluminum alloys and polycarbonate (*which are disclosed and used by Landin et al.*) are known to possess flexural modulus values exceeding 250 kpsi.

9. Claims 2, 8 – 10 and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Landin et al. in view of Sandstrom and Zou et al. as applied above, and further in view of Hirata et al. (U.S. Patent No. 6,127,017).

Landin et al., Sandstrom et al. and Zou et al. are relied upon as described above.

Regarding claim 2, none of the above disclose a method of reproducing where at least a portion of the energy field passes through the data layer and is reflected back through the data layer (i.e. a "reflecting layer" located between the substrate and the data layer).

However, Hirata et al. disclose adding a reflecting layer between the substrate and the data layer, which would necessarily reflect at least a portion of the energy field back through the data layer, if an optical or magneto-optical disk is being produced (*col. 8, lines 37 – 41 and Figure 10*).

It would therefore have been obvious to one having ordinary skill in the art to have modified the invention of Landin et al. in view of Sandstrom and Zou et al. to include a reflecting layer between the substrate and the data layer, thereby necessarily reflecting at least a portion of the energy field back through the data layer at taught by Hirata et al. inorder to produce an optical or magneto-optical disk.

Regarding claims 8, 9 and 60, Hirata et al. teach adding surface features to meeting applicants' claimed limitations to the substrate and all subsequently formed layers for landing zone texture, servo tracking or data patterns (*Figures 8A – 8C; col. 6, lines 5 – 26; and col. 14, lines 5 – 32*). It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Landin et al. in view of Sandstrom and Zou et al. to include surface features meeting applicants' claimed limitations as taught by Hirata et al. inorder to provide landing zone texture, servo tacking or data patterns.

Regarding claim 10, the percent replication is deemed a results effective variable in terms of reproducibility and running quality. It would have been obvious to one having ordinary skill in the art to have maximized the value of a results effective variable such as the replication percent through routine experimentation, especially given the knowledge that the more reproducible the surface features are the better the servo tracking, data storage and running properties would be (i.e. if the surface features are for servo tracking and are not identical, the tracking would not always be accurate resulting in poor performance).

10. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Landin et al. in view of Sandstrom and Zou et al. as applied above, and further in view of Yamashita et al. (U.S. Patent No. 6,411,457 B2).

Landin et al., Sandstrom et al. and Zou et al. are relied upon as described above.

None of above disclose rotating said storage media at a variable speed.

However, Yamashita et al. teach that it is known to rotate storage media at variable speed inorder to utilize a CLV (Constant Linear Velocity) system (*col. 1, lines 39 – 43*).

It would therefore have been obvious to one having ordinary skill in the art to have modified the invention of Landin et al. in view of Sandstrom and Zou et al. to rotate the storage medium at a variable speed inorder to utilize a CLV system.

11. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Landin et al. in view of Sandstrom and Zou et al. as applied above, and further in view of Wu et al. (U.S. Patent No. 6,156,422).

Landin et al., Sandstrom et al. and Zou et al. are relied upon as described above.

None of above disclose the coercivity of the data storage layer.

However, Wu et al. teach that for high areal recording density, the "linear recording density can be increased by increasing the coercivity of the magnetic recording medium" (*col. 1, lines 23 – 33*) and further teaches coercivity values meeting applicants' claimed limitations as desired for high areal recording density recording media (*Figure 4A*).

It would therefore have been obvious to one having ordinary skill in the art to have modified the invention of Landin et al. in view of Sandstrom and Zou et al. by increasing the coercivity of the data storage layer to values meeting applicants' claimed limitations as taught by Wu et al., since an increased coercivity results in an increased areal recording density.

12. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Landin et al. in view of Sandstrom and Zou et al. as applied above, and further in view of Guha et al. (U.S. Patent No. 6,146,755).

Landin et al., Sandstrom et al. and Zou et al. are relied upon as described above.

None of above disclose a medium capable of a recording density of at least 25 $Gbit/in^2$.

However, Guha et al. teach that with the proper selection of magnetic material and the magnetic head, a recording medium capable of high recording densities meeting applicants' claimed limitations can be formed (*col. 1, lines 23 – 57; col. 2, lines 42 – 67; col. 3, lines 5 – 22; and col. 5, lines 33 – 45*).

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Landin et al. in view of Sandstrom and Zou et al. to use a medium capable of meeting applicants' claimed areal recording density as taught by Guha et al. inorder to form a medium capable of high recording densities.

13. Claims 11 – 13 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Landin et al. in view of Sandstrom and Zou et al. as applied above, and further in view of O'Hollaren et al. (U.S. Patent No. 6,154,438).

Landin et al., Sandstrom et al. and Zou et al. are relied upon as described above.

None of the above disclose an edge lift height meeting applicants' claimed magnitudes. The Examiner notes that the edge lift height is the "lip" or "ski-jump" commonly formed at the exterior diameter of a disk substrate (*applicants' specification, Paragraph 0036*).

However, O'Hollaren et al. teach that it is known in the art to reduce the edge lift height to applicants' claimed magnitude or less inorder to allow for more of the surface of the disk to be used for recording, and hence a greater recording density (*col. 1, lines 14 – 16 and lines 47 – 67; col. 2, lines 16 – 25; col. 15, lines 36 – 39; col. 15, line 64 bridging col. 16, line 22; and col. 16, line 55 bridging col. 17, line* 2).

It would, therefore, have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Landin et al. in view of Sandstrom and Zou et al. to further include an edge lift height meeting applicants' claimed magnitudes as taught by O'Hollaren et al. since by reducing or eliminating the edge lift height more of the surface of the disk to be used for recording, and hence a greater recording density can be achieved.

14. Claims 21 – 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Landin et al. in view of Sandstrom and Zou et al. as applied above, and further in view of Bonnebat et al. (U.S. Patent No. 4,987,020) and Nigam et al. (U.S. Patent No. 5,968,627).

Landin et al., Sandstrom et al. and Zou et al. are relied upon as described above.

None of the above teach a moment of inertia meeting applicants' claimed magnitude limitations.

However, Bonnebat et al. and Nigam et al. teach that low moment of inertia substrates are desired inorder to reduce spin-up times during disk start-up and lower power consumption (*Bonnebat et al. - col. 1, lines 45 – 46; col. 2, lines 23 – 30 and col. 4, lines 4 – 14; Nigam et al., col. 11, lines 38 – 46*).

It would, therefore, have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Landin et al. in view of Sandstrom and Zou et al. to minimize the substrates moment of inertia per the teachings of Bonnebat et al. and Nigam et al. inorder to reduce spin-up times during disk start-up and lower power consumption.

15. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Landin et al. in view of Sandstrom and Zou et al. as applied above, and further in view of Bonnebat et al. ('020), Ito et al. (WO 98/42493), and Yotsuya et al. (U.S. Patent No. 6,335,843 B2). See U.S. Patent No. 6,096,419 which is the U.S. Equivalent of PCT WO98/42493.

Landin et al., Sandstrom et al. and Zou et al. are relied upon as described above.

None of the above teach a moisture content which varies according to applicants' claimed limitations.

However, Bonnebat et al., Ito et al. and Yotsuya et al. teach that it is important for the substrate to possess a "high dimensional stability with regard to temperature or moisture" (*Bonnebat et al., col. 1, lines 42 – 44; col. 2, lines 55 – 59; and col. 12, lines 36 – 44*), including resistance to moisture absorption since "the lower the moisture absorption rate, the smaller the change in size ... so that electromagnetic transducing ability holds high" (*Ito et al., col. 4, lines 8 – 14*) and sticking between the head and magnetic disc due to moisture is avoided (*Yotsuya et al. – col. 1, lines 34 – 40*).

It would, therefore, have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Landin et al. in view of Sandstrom and Zou et al. to possess a moisture content which varies according to applicants' claimed limitation as taught by Bonnebat et al., Ito et al. and Yotsuya et al. since it is important for the substrate to possess a "high dimensional stability with regard to temperature or moisture", including resistance to moisture absorption since "the lower the moisture absorption rate, the smaller the change in size ... so that electromagnetic transducing ability holds high" and sticking between the head and magnetic disc due to moisture is avoided.

16. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Landin et al. in view of Sandstrom, Zou et al., Bonnebat et al. ('020) and Nigam et al. ('627) as applied above, and further in view of Fujita et al. (U.S. Patent No. 4,870.429).

Landin et al., Sandstrom et al., Zou et al., Bonnebat et al. and Nigam et al. are relied upon as described above.

None of the above teach a substrate possessing a specific gravity meeting applicants' claimed magnitude.

However, Fujita et al. teach using a foamed damping material versus the solid viscoelastic damping material used by Landin et al. to reduce the weight of the substrate (*col. 1, lines 39 – 61; col. 1, line 66 bridging col. 2, line 2; col. 2, lines 62 – 68; and examples*), and the Examiner notes that the specific gravity (i.e. density) of the substrate is dependent on the overall densities and percentages of all the materials forming the substrate. The Examiner further notes that the specific gravity directly impacts the moment of inertia (*Bonnebat et al., col. 1, lines 45 – 46 and col. 2, lines 23 – 30*) and one of ordinary skill in the art would have been motivated to reduce the specific gravity per the teachings of Fujita et al. inorder to reduce the moment of inertia inorder to reduce spin-up times during disk start-up and lower power consumption (*Nigam et al., col. 11, lines 38 – 46 and Bonnebat et al., col. 4, lines 4 – 14*).

It would, therefore, have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Landin et al. in view of Sandstrom, Zou et al., Bonnebat et al. and Nigam et al. to possess a minimized specific gravity meeting applicants' claimed limitations as taught by Fujita et al., Bonnebat et al.

and Nigam et al. inorder to reduce the moment of inertia inorder to reduce spin-up times during disk start-up and lower power consumption.

17. Claims 40, 41, 43 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Landin et al. in view of Sandstrom and Zou et al. as applied above, and further in view of Yamaguchi et al. (DE 43-26296 A1). See provided English translation of DE '296 A1.

Landin et al., Sandstrom et al. and Zou et al. are relied upon as described above.

None of the above teach a substrate or a substrate core meeting applicants' claimed shape limitations.

However, Yamaguchi teaches forming substrates, including the cores and any layers deposited on them, such that they meet applicants' claimed shape limitations inorder to make the disks lighter and to allow for easy insertion into stacked disk drives (*page 7, lines 5 – 8 and lines 16 – 20; page 8, lines 1 – 8; page 11, lines 2 – 9; and Figures 3, 5, 7, 9 and 11*).

It would, therefore, have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Landin et al. in view of Sandstrom and Zou et al. to use a substrate and/or substrate core structure meeting applicants' claimed limitations as taught by Yamaguchi since such a shape allows the disks to be lighter and allows for easier insertion into stacked disk drives.

18. Claims 56 and 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Landin et al. in view of Sandstrom and Zou et al. as applied above, and further in view of Kuromiya et al. (U.S. Patent No. 5,585,989), Oniki et al. (U.S. Patent No. 5,875,083), and Miyake et al. (U.S. Patent No. 5,585,159).

Landin et al., Sandstrom et al. and Zou et al. are relied upon as described above.

None of the above teach modal frequencies meeting applicants' claimed limitations.

However, Kuromiya et al., Oniki et al. and Miyake et al. all teach that one of ordinary skill in the art would have been motivated to produce a disk with no resonance/modal frequencies below the operating frequency range inorder to "provide a magnetic disc substrate capable of tracking with high precision" (*Kuromiya et al. - col. 1, lines 11 – 25; col. 1, line 61 bridging col. 2, line 11; and Tables; Oniki et al. - col. 3, lines 63 – 67; and Miyake et al. – col. 1, line 65 bridging col. 2, line 8; col. 2, lines 23 – 44; and col. 4, lines 1 – 29*).

It would, therefore, have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Landin et al. in view of Sandstrom and Zou et al. to possess resonance/modal frequencies meeting applicants' claimed limitations as taught by Kuromiya et al., Oniki et al. and Miyake et al. inorder to "provide a magnetic disc substrate capable of tracking with high precision".

19. Claims 1, 5, 6, 16, 17, 24, 30, 33, 39 and 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otada et al. (JP 63-205817 A) in view of Sandstrom ('461) and Zou et al. ('015). See provided English Translation of JP '817 A.

Regarding claims 1, 16, 17 and 24, Otada et al. disclose a substrate for a magnetic storage medium comprising at least one plastic resin portion (*Figure 1 element 2*) disposed between at least one data layer (*page 4, lines 8 - 11*) and a substrate (*Figure 1, element 1*)

Regarding the limitations "a method for retrieving data comprising rotating a storage media" and "directing an energy field at said storage media such that said energy field is incident upon the data layer before it can be incident upon the substrate and retrieving information from the data layer via said energy field", the Examiner notes that since Otada et al. disclose a magnetic recording *disk* wherein the magnetic layer is deposited above a ceramic + polymer substrate, that one of ordinary skill in the art would readily recognize that inorder to retrieve data written in the data layer, one must rotate the disk and that the recording/reproducing head would be positioned above the data layer such that the energy field would be incident upon the data layer before the substrate since magnetic fields would not pass through the ceramic and polymeric substrate without difficulty. As such, the Examiner takes official notice that the limitations "a method of retrieving data comprising rotating a storage media" and "directing [a magnetic] field at said storage media such that said [magnetic] field is incident upon the data layer before it can be incident upon the substrate and retrieving information from the data layer via said [magnetic] field" are clearly within the

knowledge of one of ordinary skill in the art given that Otada et al. disclose that the substrate is for use as a magnetic recording disk. The plethora of art previously and currently provided by both the Examiner and applicants support the Examiner's position.

Regarding the limitation(s) "axial displacement peak ... under shock or vibration excitation", the Examiner has given the term(s) the broadest reasonable interpretation(s) consistent with the written description in applicants' specification as it would be interpreted by one of ordinary skill in the art. *In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997); *In re Donaldson Co., Inc.*, 16 F.3d 1190, 1192-95, 29 USPQ2d 1845, 1848-50 (Fed. Cir. 1994). See MPEP 2111.

Specifically, the axial displacement peak is the displacement of the medium measured in the peak-to-peak amplitude when a force or excitation is applied to the disk. I.e. the extent of height variations due to vibrations from the shock or vibration excitation (*see Paragraphs 0031, 0032, 0042 and examples*). The examiner notes that presently the claims do not recite under which magnitude of shock or vibration. The Examiner further notes that applicants' admit that the axial displacement peak is not a function solely of the media and that the "axial displacement can be reduced by utilizing a vibration damping material in the restraining device, or clamping structure, that holds the substrate (*Paragraph 0042*).

Otada et la. fails to teach an explicit measurement of the axial displacement or surface roughness.

However, Sandstrom and Zou et al. provide explicit teachings to control the axial displacement to values meeting applicants' claimed ranges inorder to reduce the

occurrence of head slap and insure good read/write properties of the medium (*Sandstrom, Figure 4; col. 2, lines 20 – 35; col. 2, line 63 bridging col. 3, line 18; col. 3, line 30 bridging col. 4, line 14; and col. 10, line 27 bridging col. 11, line 51; and Zou et al., col. 1, lines 39 – 43; col. 4, line 61 bridging col. 5, line 5; and Figure 1*).

Zou et al. further teach that the surface roughness should be controlled to within applicants' claimed range because such a surface "reduces a space between the magnetic head and the magnetic disc, thereby enhancing the recording density as an advantage" (*col. 5, lines 44 – 58*).

It would, therefore, have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Otada et al. to possess an axial displacement peak under shock or vibration excitation and a surface roughness meeting applicants' claimed magnitudes as taught by Sandstrom and Zou et al. inorder to reduce the occurrence of head slap, insure good read/write properties of the medium, and to reduce a space between the magnetic head and the magnetic disc, thereby enhancing the recording density.

Regarding the limitation of "an areal density of about …" in claims 5 and 6, the Examiner notes the Sandstrom (*col. 3, lines 51 – 57 and col. 9, lines 35 – 38*) teaches that forming recording media capable of possessing areal recording densities of about 10 Gbit/in^2 or higher is within the knowledge of one of ordinary skill in the art and the disclosed substrates are deemed to be capable of obtaining the claimed recording density depending on the choice of magnetic layers and the type/spacing of magnetic head used.

Regarding claim 30, Otada et al. disclose substrate material meeting applicants' claimed Markush limitation (*page 2 – "Discussion of Invention", e.g. ceramic*).

Regarding claim 33, Otada et al. disclose plastic resin portions meeting applicants' claimed material limitations (*page 4, lines 1 - 4*).

Regarding claim 39, Otada et al. disclose substrates having substantially constant thickness (*Figure 1*).

Regarding claim 59, Otada et al. disclose substrate materials which are deemed to necessarily possess a flexural modulus greater than about 250 kpsi (*i.e. ceramics*). The Examiner's sound basis for this position is that materials such as ceramics are known to possess flexural modulus values far exceeding 250 kpsi.

20. Claims 2, 8 – 10 and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otada et al. in view of Sandstrom and Zou et al. as applied above, and further in view of Hirata et al. ('017) and Landin et al. ('774).

Otada et al., Sandstrom et al. and Zou et al. are relied upon as described above.

Regarding claim 2, none of the above disclose a method of reproducing where at least a portion of the energy field passes through the data layer and is reflected back through the data layer (i.e. a "reflecting layer" located between the substrate and the data layer). The Examiner notes that this structure is primarily used for an optical or magneto-optical recording medium, which is not disclosed in the Otada et al. reference.

However, Landin et al. teach that substrates useable for magnetic recording are also suitable for use in optical or magneto-optical recording and that the type of

recording simply depends on the layer structure deposited subsequent to the substrate (*col. 2, line 63 bridging col. 3, line 10 and col. 11, lines 12 – 20*). Furthermore, Hirata et al. disclose adding a reflecting layer between the substrate and the data layer, which would necessarily reflect at least a portion of the energy field back through the data layer, if an optical or magneto-optical disk is being produced (*col. 8, lines 37 – 41 and Figure 10*).

It would therefore have been obvious to one having ordinary skill in the art to have modified the invention of Otada et al. in view of Sandstrom and Zou et al. to include a reflecting layer between the substrate and the data layer, thereby necessarily reflecting at least a portion of the energy field back through the data layer as taught by Landin et al. and Hirata et al. inorder to produce an optical or magneto-optical disk.

Regarding claims 8, 9 and 60, Hirata et al. teach adding surface features to meeting applicants' claimed limitations to the substrate and all subsequently formed layers for landing zone texture, servo tracking or data patterns (*Figures 8A – 8C; col. 6, lines 5 – 26; and col. 14, lines 5 – 32*). It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Otada et al. in view of Sandstrom and Zou et al. to include surface features meeting applicants' claimed limitations as taught by Hirata et al. inorder to provide landing zone texture, servo tacking or data patterns.

Regarding claim 10, the percent replication is deemed a results effective variable in terms of reproducibility and running quality. It would have been obvious to one having ordinary skill in the art to have maximized the value of a results effective variable

such as the replication percent through routine experimentation, especially given the knowledge that the more reproducible the surface features are the better the servo tracking, data storage and running properties would be (i.e. if the surface features are for servo tracking and are not identical, the tracking would not always be accurate resulting in poor performance).

21. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Otada et al. in view of Sandstrom and Zou et al. as applied above, and further in view of Yamashita et al. (;457 B2).

Otada et al., Sandstrom et al. and Zou et al. are relied upon as described above.

None of above disclose rotating said storage media at a variable speed.

However, Yamashita et al. teach that it is known to rotate storage media at variable speed inorder to utilize a CLV (Constant Linear Velocity) system (*col. 1, lines 39 – 43*).

It would therefore have been obvious to one having ordinary skill in the art to have modified the invention of Otada et al. in view of Sandstrom and Zou et al. to rotate the storage medium at a variable speed inorder to utilize a CLV system.

22. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Otada et al. in view of Sandstrom and Zou et al. as applied above, and further in view of Wu et al. (U.S. Patent No. 6,156,422).

Otada et al., Sandstrom et al. and Zou et al. are relied upon as described above.

None of above disclose the coercivity of the data storage layer.

However, Wu et al. teach that for high areal recording density, the "linear recording density can be increased by increasing the coercivity of the magnetic recording medium" (*col. 1, lines 23 – 33*) and further teaches coercivity values meeting applicants' claimed limitations as desired for high areal recording density recording media (*Figure 4A*).

It would therefore have been obvious to one having ordinary skill in the art to have modified the invention of Otada et al. in view of Sandstrom and Zou et al. by increasing the coercivity of the data storage layer to values meeting applicants' claimed limitations as taught by Wu et al., since an increased coercivity results in an increased areal recording density.

23. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Otada et al. in view of Sandstrom and Zou et al. as applied above, and further in view of Guha et al. (U.S. Patent No. 6,146,755).

Otada et al., Sandstrom et al. and Zou et al. are relied upon as described above.

None of above disclose a medium capable of a recording density of at least 25 Gbit/in^2.

However, Guha et al. teach that with the proper selection of magnetic material and the magnetic head, a recording medium capable of high recording densities meeting applicants' claimed limitations can be formed (*col. 1, lines 23 – 57; col. 2, lines 42 – 67; col. 3, lines 5 – 22; and col. 5, lines 33 – 45*).

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Otada et al. in view of Sandstrom and Zou et al. to use a medium capable of meeting applicants' claimed areal recording density as taught by Guha et al. inorder to form a medium capable of high recording densities.

24. Claims 11 – 13 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otada et al. in view of Sandstrom and Zou et al. as applied above, and further in view of O'Hollaren et al. (U.S. Patent No. 6,154,438).

Otada et al., Sandstrom et al. and Zou et al. are relied upon as described above.

None of the above disclose an edge lift height meeting applicants' claimed magnitudes. The Examiner notes that the edge lift height is the "lip" or "ski-jump" commonly formed at the exterior diameter of a disk substrate (*applicants' specification, Paragraph 0036*).

However, O'Hollaren et al. teach that it is known in the art to reduce the edge lift height to applicants' claimed magnitude or less inorder to allow for more of the surface of the disk to be used for recording, and hence a greater recording density (*col. 1, lines 14 – 16 and lines 47 – 67; col. 2, lines 16 – 25; col. 15, lines 36 – 39; col. 15, line 64 bridging col. 16, line 22; and col. 16, line 55 bridging col. 17, line 2*).

It would, therefore, have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Otada et al. in view of Sandstrom and Zou et al. to further include an edge lift height meeting applicants'

claimed magnitudes as taught by O'Hollaren et al. since by reducing or eliminating the edge lift height more of the surface of the disk to be used for recording, and hence a greater recording density can be achieved.

25. Claims 21 – 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otada et al. in view of Sandstrom and Zou et al. as applied above, and further in view of Bonnebat et al. (U.S. Patent No. 4,987,020) and Nigam et al. (U.S. Patent No. 5,968,627).

Otada et al., Sandstrom et al. and Zou et al. are relied upon as described above.

None of the above teach a moment of inertia meeting applicants' claimed magnitude limitations.

However, Bonnebat et al. and Nigam et al. teach that low moment of inertia substrates are desired inorder to reduce spin-up times during disk start-up and lower power consumption (*Bonnebat et al. - col. 1, lines 45 – 46; col. 2, lines 23 – 30 and col. 4, lines 4 – 14; Nigam et al., col. 11, lines 38 – 46*).

It would, therefore, have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Otada et al. in view of Sandstrom and Zou et al. to minimize the substrates moment of inertia per the teachings of Bonnebat et al. and Nigam et al. inorder to reduce spin-up times during disk start-up and lower power consumption.

26. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Otada et al. in view of Sandstrom and Zou et al. as applied above, and further in view of Bonnebat et al. ('020), Ito et al. (WO 98/42493), and Yotsuya et al. (U.S. Patent No. 6,335,843 B2). See U.S. Patent No. 6,096,419 which is the U.S. Equivalent of PCT WO98/42493.

Otada et al., Sandstrom et al. and Zou et al. are relied upon as described above.

None of the above teach a moisture content which varies according to applicants' claimed limitations.

However, Bonnebat et al., Ito et al. and Yotsuya et al. teach that it is important for the substrate to possess a "high dimensional stability with regard to temperature or moisture" (*Bonnebat et al., col. 1, lines 42 – 44; col. 2, lines 55 – 59; and col. 12, lines 36 – 44*), including resistance to moisture absorption since "the lower the moisture absorption rate, the smaller the change in size ... so that electromagnetic transducing ability holds high" (*Ito et al., col. 4, lines 8 – 14*) and sticking between the head and magnetic disc due to moisture is avoided (*Yotsuya et al. – col. 1, lines 34 – 40*).

It would, therefore, have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Otada et al. in view of Sandstrom and Zou et al. to possess a moisture content which varies according to applicants' claimed limitation as taught by Bonnebat et al., Ito et al. and Yotsuya et al. since it is important for the substrate to possess a "high dimensional stability with regard to temperature or moisture", including resistance to moisture absorption since "the lower the moisture absorption rate, the smaller the change in size ... so that electromagnetic

transducing ability holds high" and sticking between the head and magnetic disc due to moisture is avoided.

27. Claims 28, 56 and 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otada et al. in view of Sandstrom and Zou et al. as applied above, and further in view of Kuromiya et al. (U.S. Patent No. 5,585,989), Oniki et al. (U.S. Patent No. 5,875,083), and Miyake et al. (U.S. Patent No. 5,585,159).

Otada et al., Sandstrom et al. and Zou et al. are relied upon as described above.

None of the above teach modal frequencies meeting applicants' claimed limitations.

However, Kuromiya et al., Oniki et al. and Miyake et al. all teach that one of ordinary skill in the art would have been motivated to produce a disk with no resonance/modal frequencies below the operating frequency range (i.e. greater than 250 Hz) inorder to "provide a magnetic disc substrate capable of tracking with high precision" (*Kuromiya et al. - col. 1, lines 11 – 25; col. 1, line 61 bridging col. 2, line 11; and Tables; Oniki et al. - col. 3, lines 63 – 67; and Miyake et al. – col. 1, line 65 bridging col. 2, line 8; col. 2, lines 23 – 44; and col. 4, lines 1 – 29*).

It would, therefore, have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Otada et al. in view of Sandstrom and Zou et al. to possess resonance/modal frequencies meeting applicants' claimed limitations as taught by Kuromiya et al., Oniki et al. and Miyake et al. inorder to "provide a magnetic disc substrate capable of tracking with high precision".

28. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Otada et al. in view of Sandstrom, Zou et al., Bonnebat et al. ('020) and Nigam et al. ('627) as applied above, and further in view of Fujita et al. (U.S. Patent No. 4,870.429).

Otada et al., Sandstrom et al., Zou et al., Bonnebat et al. and Nigam et al. are relied upon as described above.

None of the above teach a substrate possessing a specific gravity meeting applicants' claimed magnitude.

However, Fujita et al. teach using a foamed damping material versus the solid viscoelastic damping material used by Landin et al. to reduce the weight of the substrate (*col. 1, lines 39 – 61; col. 1, line 66 bridging col. 2, line 2; col. 2, lines 62 – 68; and examples*), and the Examiner notes that the specific gravity (i.e. density) of the substrate is dependent on the overall densities and percentages of all the materials forming the substrate. The Examiner further notes that the specific gravity directly impacts the moment of inertia (*Bonnebat et al., col. 1, lines 45 – 46 and col. 2, lines 23 – 30*) and one of ordinary skill in the art would have been motivated to reduce the specific gravity per the teachings of Fujita et al. inorder to reduce the moment of inertia inorder to reduce spin-up times during disk start-up and lower power consumption (*Nigam et al., col. 11, lines 38 – 46 and Bonnebat et al., col. 4, lines 4 – 14*).

It would, therefore, have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Otada et al. in view of Sandstrom, Zou et al., Bonnebat et al. and Nigam et al. to possess a minimized specific

gravity meeting applicants' claimed limitations as taught by Fujita et al., Bonnebat et al. and Nigam et al. inorder to reduce the moment of inertia inorder to reduce spin-up times during disk start-up and lower power consumption.

29. Claims 40 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otada et al. in view of Sandstrom and Zou et al. as applied above, and further in view of Yamaguchi et al. (DE 43-26296 A1). See provided English translation of DE '296 A1.

Otada et al., Sandstrom et al. and Zou et al. are relied upon as described above.

None of the above teach a substrate meeting applicants' claimed shape limitations.

However, Yamaguchi teaches forming substrates and any layers deposited on them, such that they meet applicants' claimed shape limitations inorder to make the disks lighter and to allow for easy insertion into stacked disk drives (*page 7, lines 5 – 8 and lines 16 – 20; page 8, lines 1 – 8; page 11, lines 2 – 9; and Figures 3, 5, 7, 9 and 11*).

It would, therefore, have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Otada et al. in view of Sandstrom and Zou et al. to use a substrate structure meeting applicants' claimed limitations as taught by Yamaguchi since such a shape allows the disks to be lighter and allows for easier insertion into stacked disk drives.

Allowable Subject Matter

30. The following is a statement of reasons for the indication of allowable subject matter: claim 58 recites the limitation "wherein said storage media has only one modal frequency less than an operating frequency", which is neither anticipated nor rendered obvious by the prior art of record. While the prior art teaches that it is known to make storage media such that *no* modal frequencies are below the operating frequency, the prior art of record fails to provide sufficient motivation to produce a storage media possessing *exactly one* modal frequency that is below the operating frequency.

Response to Arguments

31. The rejection of claims 1 – 57, 59 and 60 under 35 U.S.C § 103(a) – Landin et al., alone or in view of various references

The rejection of claims 1 – 13, 16 – 18, 21 – 24, 27 – 30, 33, 39 – 41, 56, 57, 59 and 60 under 35 U.S.C § 103(a) – Otada et al., alone or in view of various references

Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

32. The prior rejection of claims 1 - 60 under 35 U.S.C § 103(a) – Chang et al.

Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

33. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. HTML document titled “Flexural Properties” is provided to illustrate some typical flexural modulus values of common polymers, including polycarbonate (350 kpsi) and nylon 6,6 (380 kpsi), as well as indicating that the flexural modulus is “used to indicate the bending stiffness of a material”.

34. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M Bernatz whose telephone number is (571) 272-1505. The examiner can normally be reached on M-F, 9:00 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on (571) 272-1535. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kevin M. Bernatz, PhD.
Primary Examiner

August 6, 2004